

Claims:

1. Stretching apparatus for use in stretching the lower limbs of a human subject comprising:

5 at least one cradle configured to support a leg, or part thereof, of said subject, said cradle moveable between a non-stretching position and a stretching position; and

10 at least one cradle movement means operable to move said cradle between said non-stretching and stretching positions,

wherein said cradle movement means comprises:

15 first movement means configured to move said cradle through a first plane of movement; and

second movement means configured to rotate said cradle through a second plane of movement transverse to said first plane of movement.

20 2. Stretching apparatus as claimed in claim 1, wherein each said cradle is attached to a respective said cradle movement means at a first end of said cradle, said cradle extending from the connected cradle movement means to a second end.

25 3. Stretching apparatus as claimed in claim 1 or 2, wherein said cradle comprises a first portion configured to support a portion of the subject's leg below the subject's knee, a second portion configured to support the subject's leg above the knee and a hinge connecting said first and second portions.

-39-

4. Stretching apparatus as claimed in claim 3, wherein said first and second portions are moveable about said hinge to position the subject's leg in either straight or bent position.

5 5. Stretching apparatus as claimed in any of claims 1 to 4, wherein said cradle further comprises means to adjust the cradle length.

10 6. Stretching apparatus as claimed in claim 5, wherein said means to adjust the cradle length comprises a guide slot having a plurality of notches forming a plurality of adjustment positions; and

a portion of said cradle comprises positioning means configured to locate in said notches,

15 wherein said cradle length is slideably adjustable by movement of said positioning means between said notches.

20 7. Stretching apparatus as claimed in any of claims 1 to 6, wherein said cradle forms a channel configured to receive the subject's leg.

8. Stretching apparatus as claimed in claim 7 further comprising at least one fastening strap arranged to fasten across said channel and subject's leg contained therein.

25 9. Stretching apparatus as claimed in any of claims 3 to 8, further comprising a locking means extending between said first and second cradle portions, said locking means arranged to releasably lock said cradle in a selected configuration.

-40-

10. Stretching apparatus as claimed in claim 9 wherein said locking means comprises a latch member.

11. Stretching apparatus as claimed in claim 9 wherein said 5 locking means comprises a spring loaded plunger.

12. Stretching apparatus as claimed in any of claims 1 to 11, wherein said first movement means comprises a first bearing and axle member connected to one end of a respective said cradle, rotation of said 10 axle member about said first bearing operating raising or lowering of said cradle.

13. Stretching apparatus as claimed in any of claims 1 to 12, wherein said second movement means comprises a second bearing 15 arranged such that rotation of said second bearing operates rotation of an attached cradle through a plane of constant height.

14. Stretching apparatus as claimed in claims 12 and 13, wherein said first and second bearings rotate through said first and second 20 planes of movement, each said plane of movement offset to the other by 90°.

15. Stretching apparatus as claimed in any preceding claim wherein said cradle movement means comprises at least one ratchet 25 operable to maintain a said movement means and connected cradle in a selected position.

16. Stretching apparatus as claimed in claim 15, wherein said ratchet provides a fine control mechanism for controlling position of a said 30 cradle during stretching.

-41-

17. Stretching apparatus as claimed in any preceding claim, wherein a said movement means further comprises a damping mechanism configured to dampen return movement of a said cradle from a stretching position to a non-stretching position.

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18. Stretching apparatus as claimed in any preceding claim, wherein said cradle movement means further comprises locking means arranged to maintain a said attached cradle in a first selected position, said locking means releasable to enable movement of said cradle to a 10 second selected position.

19. Stretching apparatus as claimed in any preceding claim, wherein said cradle movement means further comprises means to measure the movement of a said cradle through a said plane of 15 movement.

20. Stretching apparatus as claimed in any preceding claim, wherein said cradle movement means comprises a handle portion operable for movement of said cradle through said first and second planes 20 of movement.

21. Stretching apparatus as claimed in any preceding claim, wherein said cradle movement means further comprises a height adjustment mechanism.

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22. Stretching apparatus as claimed in claim 21, wherein said height adjustment mechanism is adjustable to align an axis extending through the subject's hip joints with the axis of rotation of said first movement means.

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23. Stretching apparatus as claimed in any preceding claim, wherein said apparatus comprises two cradle movement means, each connected to a separate said cradle, wherein a frame portion extends between said cradle movement means.

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24. Stretching apparatus as claimed in claim 23, wherein each said cradle movement means is slideably mounted on said frame portion, said frame portion further comprising adjustment means arranged to adjust the mounting position of each said cradle movement means and thereby the width between said cradle movement means.

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25. Stretching apparatus as claimed in any preceding claim wherein support means is provided to support at least one cradle in a position of 0° flexion.

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26. Stretching apparatus as claimed in any preceding claim, wherein each said cradle comprises a support leg hingeably mounted at one end of said leg at the underside of a portion of said cradle and configured to support said cradle in a position of 0° flexion.

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27. Stretching apparatus as claimed in claim 26, wherein said support leg further comprises a castor at a second end of said leg arranged to permit movement of said leg across a ground surface whilst supporting said cradle.

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28. Stretching apparatus as claimed in claim 25, wherein said support means comprises:

30 an arm configured to connect said cradle to said cradle movement means;

at least one roller, castor or stub extending substantially transverse to a main underside of said arm;

a support surface;

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wherein when said cradle is in a position of 0° flexion, said roller, castor or stub is in contact with said support surface.

29. Stretching apparatus as claimed in claim 25, wherein said support means comprises a support bar, said support bar configured to be in contact with a lower surface of at least one cradle when said cradle is in a position of 0° flexion.

30. Stretching apparatus as claimed in any one of claims 1 to 15, wherein each said cradle comprises a support arm mounted at one end of said arm at the underside of a portion of said cradle and configured to provide contact at another end of said support arm with a support surface, thereby supporting said cradle in a position of 0° flexion.

20 31. Stretching apparatus as claimed in any preceding claim, said apparatus further comprising a table arranged to support the upper body of said subject and connected to said apparatus at one end to support a subject in supine position.

25 32. Stretching apparatus as claimed in claim 31, wherein a distance between said table and said apparatus is adjustable in a horizontal plane.

30 33. Stretching apparatus as claimed in claim 31 or claim 32, wherein a distance between said table and said apparatus is adjustable in a vertical plane.

34. Stretching apparatus as claimed in any one of claims 31 to 33, wherein said apparatus further comprises a pelvic clamp comprising at least one clamping member moveable to engage at the pelvis of a subject 5 positioned in supine position on said apparatus, said clamp adjustable to tighten around the subject's pelvis.

35. Stretching apparatus as claimed in claim 34, wherein said clamping member is shaped to surround the pelvic iliac crests of a human 10 subject.

36. Stretching apparatus as claimed in any preceding claim wherein said cradle movement is supported in use by a cradle movement means support surface.

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37. Stretching apparatus as claimed in any preceding claim for use in performing one or more stretches of muscle and soft tissue surrounding the human hip joint taken from the set of:

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- extension stretching;
- flexion stretching;
- medial rotation stretching;
- lateral rotation stretching;
- adduction stretching;
- 25 • abduction stretching.

38. Stretching apparatus for use in stretching the lower limbs of a human subject comprising:

30 at least one cradle configured to support a leg, or part thereof, of said subject, said cradle moveable between a non-stretching position and a

-45-

stretching position, in use said cradle thereby positioning said leg, or part thereof, in said non-stretching and stretching positions respectively; and

5 at least one cradle movement means operable to move said cradle between said non-stretching and stretching positions, in use said cradle movement means thereby moving said leg, or part thereof, between said non-stretching and stretching positions,

wherein said cradle movement means comprises:

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first movement means configured to move said cradle through a first plane of movement for performing a first set of stretches; and

15 second movement means configured to rotate said cradle through a second plane of movement transverse to said first plane of movement for performing a second set of stretches.

39. Stretching apparatus for use in stretching the lower limbs of a human subject comprising:

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a support table configured to support said subject's back and upper body in supine position; and

25 at least one cradle extending from one end of said table, said cradle configured to support a leg, or part thereof, of said subject, said cradle moveable between a non-stretching position and a stretching position; and

30 at least one cradle movement means operable by said subject from said supine position to move said cradle between said non-stretching and stretching positions,

wherein said cradle movement means comprises:

first movement means configured to move said cradle through a first plane of movement; and

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second movement means configured to rotate said cradle through a second plane of movement transverse to said first plane of movement.

40. Stretching apparatus as claimed in claim 39, wherein two
10 said cradles are provided, said cradles configured to support first and second legs, or parts thereof, of said subject respectively, each said cradle independently moveable by a separate said cradle movement means.

41. Stretching apparatus as claimed in claim 39 or 40, wherein
15 each said cradle movement means is located in the region of one end of said cradle respectively so as to locate each said cradle movement means in use adjacent said subject's respective hip joints.

42. Stretching apparatus as claimed in any of claims 39 to 41,
20 said apparatus further comprising a clamp arranged to engage at the pelvis of a subject positioned on said apparatus in said supine position.

43. Stretching apparatus as claimed in claim 42, wherein said clamp comprises first and second clamping members arranged on
25 opposite long sides of said table and means to urge said members together.

44. Stretching apparatus for use in performing controlled stretching of the muscles and soft tissues associated with the human hip
30 joint, comprising:

two leg supports each for use in positioning a subject's leg during stretching, each leg support moveable between a stretching and non-stretching position and connected to:

5 a leg support movement means, each said leg support movement means having first and second pivots forming first and second axes of rotation, said leg support movement means operable to independently move said connected leg support through corresponding first and second planes of movement,

10 wherein movement in said first plane causes a movement of said support in a sagittal plane with respect to a human subject and movement in said second plane causes a rotation of each portion of said support in a coronal plane with respect to a human subject.

15 45. Stretching apparatus for use in performing abduction and/or adduction stretching of a human subject's thigh adductor and/or abductor muscles respectively, comprising:

20 at least one cradle configured to support a leg, or part thereof, of said subject such that said leg is held substantially in extended position, said cradle rotatable through a plane of movement; and

25 at least one cradle movement means operable to rotate said cradle about an axis of rotation and through said plane of movement so as to move said leg across and/or away from a midline of a subject's body to perform adduction and/or abduction stretches of the subject's leg respectively.

30 46. Stretching apparatus as claimed in claim 45, wherein when said human subject is substantially in the anatomical position, said plane

of movement is substantially the coronal plane with respect to said human subject.

47. Stretching apparatus as claimed in claim 45, wherein when
5 said human subject's hips are substantially in a position of 90° flexion, said
plane of movement is substantially the transverse plane with respect to
said human subject.

48. Stretching apparatus for use in performing medial or lateral
10 rotation stretching of a human subject's thigh lateral rotator or medial
rotator muscles respectively, comprising:

15 at least one cradle configured to support a leg, or part thereof, in a
position such that the thigh of the supported leg is substantially orthogonal
to the subject's upper body, said cradle rotatable about an axis of rotation
so as to move a portion of said supported leg in a direction across or away
from a midline of the subject's body to perform lateral rotation or medial
rotation stretches respectively; and

20 at least one cradle movement means operable to rotate said cradle
about said axis of rotation.

49. Stretching apparatus as claimed in claim 48, wherein in use
said axis is arranged to be substantially coincident with an axis extending
25 through a subject's respective hip joint and thigh.